

Quantum information entropy of a particle trapped by the Aharonov-Bohm-type effect

Abstract

In this research article, we use the Shannon's formalism to investigate the quantum information entropy of a particle trapped by the Aharonov-Bohm-type field. For quantum information study, it is necessary to investigate the eigenstates of the quantum system, i.e. the wave functions and energies of the quantum states. We assumed that the particle is in principle, confined in a cylindrical box in the presence of Aharonov-Bohm-type effect due to dislocation defect. Analysis of the quantum information entropy, reveals that the dislocation influences the eigenstates and, consequently, the quantum information of the system. © 2023 IOP Publishing Ltd.

Keywords

Aharonov-Bohm-type effect; Shannon's entropy; topological defect